



Miami-Dade Water & Sewer
Department

**Miami-Dade Consolidated PWS
Water Use Permit No. 13-00017-W**

**Water Conservation Plan
2016 Annual Report**

January 1, 2016 - December 31, 2016

**Miami-Dade Water & Sewer Department
3071 SW 38th Avenue
Miami, FL 33146**

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INTRODUCTION

On November 15, 2007, the South Florida Water Management District Governing Board (SFWMD) approved the Miami-Dade Consolidated Water Use Permit (WUP) which requires Miami Dade Water & Sewer Dept. (WASD) to develop a 20-year Water Use Efficiency Plan (Plan) to conserve 19.6 million gallons a day (MGD) of water by 2026. The following is a summary of changes to the WUP since the issuance of the permit:

On November 1, 2010, the SFWMD reissued the permit extending the WUP for an additional three years; on December 16, 2012, the permit was again reissued to increase the permitted allocation and to modify the water supply for the South Miami Heights Water Treatment Plant to include allocation from the Floridan aquifer. On February 9, 2015, the SFWMD issued a modification to the WUP, extending the expiration date to February 9, 2035. The permit was again re-issued on September 21, 2015 due to revisions of certain special permit conditions (specifically 12, 13, 16, 22, 26 through 35 and 38).

To comply with the original WUP requirements, WASD developed the Plan using Florida Department of Environmental Protection's Conserve Florida EZ Guide (Guide). The Guide was developed as a web-based application for goal-based water conservation planning. WASD was the first utility in the state to use the Guide to develop, administer and report its water conservation program.

Implementation of the Guide's Best Management Practices (BMPs) assists WASD with meeting the projected 19.6 MGD water savings target by 2026, as required by the WUP. As of December 31, 2016, water savings from BMPs are 15.08 MGD, exceeding the calendar year 2016 water savings goal of 11.7 MGD.

WASD hereby submits the tenth Water Conservation Plan Annual Progress Report detailing Miami Dade County's (MDC) actions and efforts to comply with Special Permit Condition No. 17 of the modified WUP.

SUMMARY

The Plan was implemented utilizing the Guide to develop and implement BMPs. The use of quantifiable BMPs has assisted in reviewing and evaluating planned and reported water savings on an annual basis to ensure the implementation of a cost-effective conservation program.

Examples of BMPs developed by the Guide and part of the Plan is the high efficiency fixture and senior rebate programs. The high efficiency fixture rebate program provides incentives to single and multi-family residential properties to install high efficiency toilets, faucets and showerheads by offering rebates of \$50, \$25 and \$25, respectively. The senior high efficiency toilet rebate program implemented in 2016 provides up to \$200 for the purchase and installation of one toilet or up to \$300 for the purchase and installation of two high efficiency toilets by low income senior homeowners of MDC.

In addition to BMPs, other measures have been developed to assist WASD to reach its water saving goals. For example, water use efficiency standards for new residential and commercial developments were enacted by the Miami-Dade Board of County Commissioners on January 1, 2009. These efficiency standards are being implemented and enforced through local building codes and include technical amendments to the Florida Building Code to require maximum water conservation flow rates for plumbing fixtures.

The County continues to implement the Permanent Landscape Irrigation Restriction Ordinance which limits landscape irrigation to two days per week. A written advisory notice is sent to follow up on formal complaints that are received through either the County's 3-1-1 system or via a web-based e-mail system. The County has also enacted a tiered water rate structure which includes a surcharge for high water use to encourage water conservation.

Engaging with the community is an important component of MDC's water conservation efforts. During 2016, WASD participated in 31 outreach and education events providing information to residents about the region's water resources and the importance of conserving it. Free giveaways are available encouraging participants to visit us and learn about WASD's incentives (BMPs) to save water. Free reusable water bottles, chip clips, fans, shower timers, aerators (all with water conservation messaging) are an example of items provided. In addition, WASD partners with Dream in Green (DIG), a local not for profit environmental educational organization, to education students and residents about the water/energy nexus. DIG's Water + Energy + Learning + Behavior (WELAB) workshops educate residents about the importance of conserving water and energy. Participants are provided a free toolkit including a high efficiency showerhead, lightbulbs, reusable water bottle and showertimers contributed by WASD. In addition, WASD conducts lightbulb and showerhead exchanges during the year at county-wide outreach events such as Adopt-a-Tree encouraging residents to bring in incandescent lightbulbs and old showerheads in exchange for energy efficient Compact Fluorescent Lamp (CFLs) lightbulbs and high efficiency showerheads free of charge.

Because of these efforts, as of December 31, 2016, Miami-Dade County is currently experiencing actual finished water demands 20 MGD lower than 2006 actual demands (the year prior to the implementation of the WUE Plan). The reduced demands are a combination of slower population growth, implementation of the County's irrigation restrictions, water conservation program and water loss reduction efforts.

SECTION I - PLAN IMPLEMENTATION

The Conserve Florida BMPs WASD has implemented as part of the Water Use Efficiency Plan are shown in Appendix A.

Due to the implementation of BMPs and other efforts detailed in the previous section, Miami-Dade County has experienced a lower than expected per capita water consumption. Figure 1 reflects the historical systemwide per capita, showing the effectiveness of WASD's water efficiency strategies. Please note that per capita calculations are revised each year based on current population data from the Miami-Dade County Planning Division of the Department of Regulatory and Economic Resources.

Table 1 shows both the estimated water savings achieved through implementation of the BMPs and the corresponding annual planned goal for water savings. As of December 31, 2016, estimated water savings from implementation of BMPs are approx. 15.1 MGD, exceeding the water savings target set for that year of 11.70 MGD.

Figure 1. Miami Dade Water & Sewer Dept. Historical Systemwide Average Finished Water Per Capita

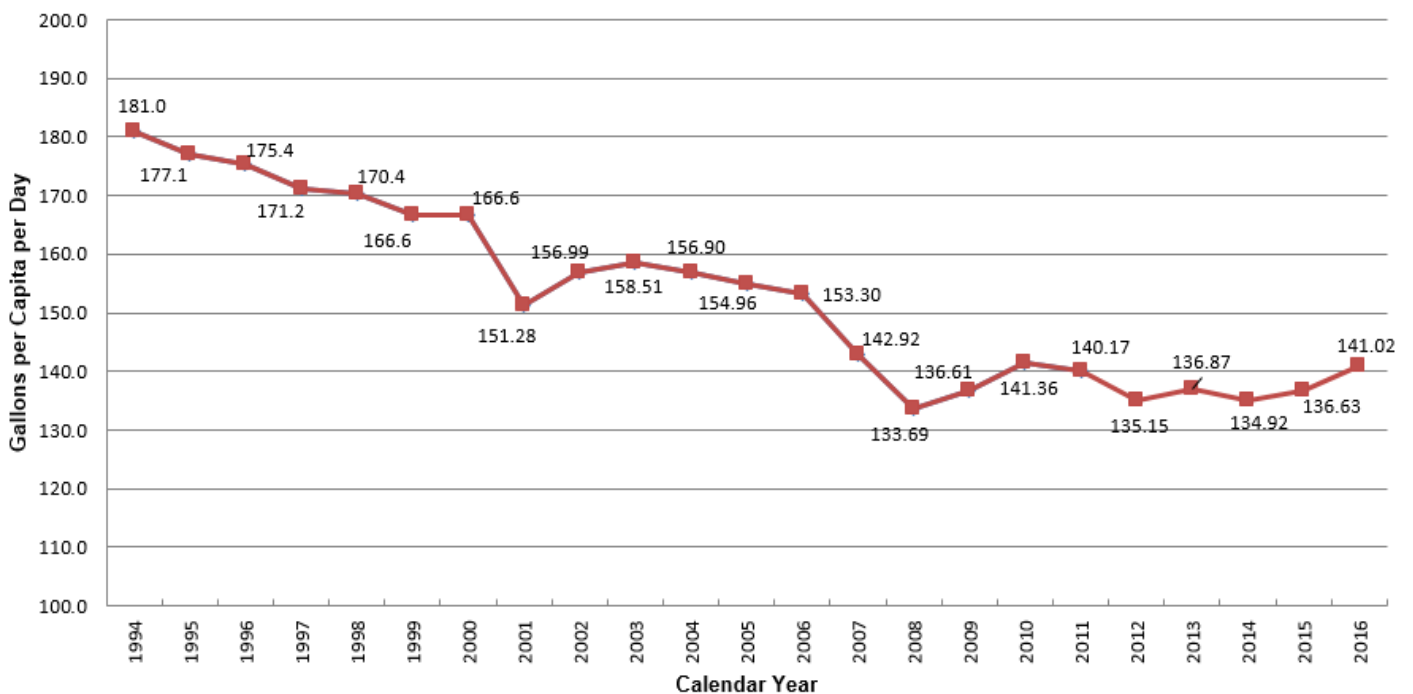


Table 1. Water Savings Report Summary

Year	Water Savings (MGD)	
	Planned	Reported
2007	1.09	1.21
2008	2.24	3.48
2009	3.53	4.90
2010	4.82	6.54
2011	6.10	8.47
2012	7.22	10.07
2013	8.42	11.23
2014	9.54	12.34
2015	10.66	14.14
2016	11.70	15.08
2026	19.62	--

**APPENDIX A - BMP IMPLEMENTATION
THROUGH DECEMBER 31, 2016**

BMP: Residential High Efficiency Toilet (HET) Rebate
Cost: \$50/rebate

Year		Units	Savings/Account gallons per account per day	Total Savings (gal/day)
2007	Planned	750	29	21,750
	Reported	971	29	28,159
	Difference	221		6,409
2008	Planned	750	29	21,750
	Reported	1253	29	36,337
	Difference	503		14,587
2009	Planned	1000	29	29,000
	Reported	3478	29	100,862
	Difference	2478		71,862
2010	Planned	2000	29	58,000
	Reported	2622	29	76,038
	Difference	622		18,038
2011	Planned	2000	29	58,000
	Reported	2566	29	74,414
	Difference	566		16,414
2012	Planned	1200	29	34,800
	Reported	1220	29	35,380
	Difference	20		580
2013	Planned	1500	29	43,500
	Reported	1547	29	44,863
	Difference	75		2,175
2014	Planned	1500	29	43,500
	Reported	1558	29	45,182
	Difference	58		1,682
2015	Planned	1450	29	42,050
	Reported	1887	29	54,723
	Difference	437		12,673

2016	Planned	1450	29	42,050
	Reported	1772	29	51,388
	Difference	322		9,338

BMP: Multifamily High Efficiency Toilet (HET) Rebate
Cost: \$50/rebate*

Year		Units	Savings/Unit Gallons per multi-family unit per day	Total Savings (gal/day)
2007	Planned	0	64	0
	Reported	0	64	0
	Difference	0		
2008	Planned	0	64	0
	Reported	0	64	0
	Difference	0		
2009	Planned	310	64	19,840
	Reported	315	64	20,160
	Difference	5		320
2010	Planned	0	64	0
	Reported	0	64	0
	Difference	0		
2011	Planned	0	64	0
	Reported	0	64	0
	Difference	0		
2012	Planned	0	64	0
	Reported	0	64	0
	Difference	0		0
2013	Planned	0	64	0
	Reported	0	64	0
	Difference	0		0
2014	Planned	0	64	0
	Reported	0	64	0
	Difference	0		0
2015	Planned	80	29	2,320
	Reported	588	29	17,052
	Difference	508		14,732

2016	Planned	80	29	2,320
	Reported	519	29	15,051
	Difference	439		12,731

*Note: incorrectly combined with Residential High Efficiency Toilet Rebates prior to 2015

BMP: Senior High Efficiency Toilet (HET) Rebate

Cost: \$200 for purchase and installation of one toilet/\$300 for purchase and installation of two toilets

Year		Units	Savings/Account gallons per account per day	Total Savings (gal/day)
2016	Planned	0	29	0
	Reported	41	29	1,189
	Difference	41		1,189

BMP: Single Family High Efficiency Showerhead Rebate
Cost: \$25/rebate*

Year		Units	Savings/Measure Gallons/Unit/Day	Total Savings Gallons Per Day (gal/day)
2007	Planned	0	35	0
	Reported	0	35	0
	Difference	0		0
2008	Planned	0	35	0
	Reported	0	35	0
	Difference	0	35	0
2009	Planned	0	35	0
	Reported	0	35	0
	Difference	0		0
2010	Planned	0	35	0
	Reported	0	35	0
	Difference	0		0
2011	Planned	0	35	0
	Reported	0	35	0
	Difference	0		0
2012	Planned	50	35	1750
	Reported	23	35	805
	Difference	-27		-945
2013	Planned	50	35	1750
	Reported	46	35	1610
	Difference	-4		-140
2014	Planned	0	35	0
	Reported	59	35	2,065
	Difference	59		2,065
2015	Planned	0	35	0
	Reported	167	35	5,845

	Difference	167		5,845
2016	Planned	0	35	0
	Reported	279	35	9,765
	Difference	279		9,660

*Note: originally \$10/rebate

BMP: Single Family High Efficiency Faucet Rebate
Cost: \$25/rebate*

Year		Units	Savings/Measure Gallons/Unit/Day	Total Savings Gallons Per Day (gal/day)
2007	Planned	0	12	0
	Reported	0	12	0
	Difference	0		0
2008	Planned	0	12	0
	Reported	0	12	0
	Difference	0		0
2009	Planned	0	12	0
	Reported	0	12	0
	Difference	0		0
2010	Planned	0	12	0
	Reported	0	12	0
	Difference	0		0
2011	Planned	0	12	0
	Reported	0	12	0
	Difference	0		0
2012	Planned	50	12	600
	Reported	107	12	1284
	Difference	57		684
2013	Planned	50	12	600
	Reported	120	12	1440
	Difference	70		840
2014	Planned	0	12	0
	Reported	151	12	1,812
	Difference	151		1,812
2015	Planned	0	12	0
	Reported	433	12	5,196

	Difference	433		5,196
2016	Planned	0	12	0
	Reported	564	12	6,768
	Difference	564		6,768

*Note: originally \$10/rebate

BMP: Large Property Landscape Irrigation Evaluation Rebate
Cost: \$2,850/rebate

Year		Units	Savings/Account Gallons/account/day	Total Savings (gal/day)
2007	Planned	20	35,000	700,000
	Reported	20	35,000	700,000
	Difference	0		
2008	Planned	20	35,000	700,000
	Reported	50	35,000	1,750,000
	Difference	30		1,050,000
2009	Planned	20	35,000	700,000
	Reported	25	35,000	875,000
	Difference	5		175,000
2010	Planned	25	35,000	875,000
	Reported	26	35,000	910,000
	Difference	1		35,000
2011	Planned	35	35,000	1,225,000
	Reported	44	35,000	1,540,000
	Difference	9		315,000
2012	Planned	25	35,000	875,000
	Reported	36	35,000	1,260,000
	Difference	11		385,000
2013	Planned	26	35,000	910,000
	Reported	28	35,000	980,000
	Difference	2		70,000
2014	Planned	27	35,000	945,000
	Reported	25	35,000	875,000
	Difference	-2		-70,000
2015	Planned	69	35,000	2,415,000
	Reported	42	35,000	1,470,000

	Difference	-27		-945,000
2016	Planned	69	various	-
	Reported	23	various	770,448
	Difference	-46		-

BMP: Single Family Home Landscape Irrigation Evaluation Rebate
Cost: \$500/rebate

Year		Units	Savings/Account Gallons/account/day	Total Savings (gal/day)
2007	Planned	0	233	0
	Reported	0	233	0
	Difference	0		
2008	Planned	0	233	0
	Reported	0	233	0
	Difference	0		
2009	Planned	200	233	46,600
	Reported	200	233	46,600
	Difference	0		
2010	Planned	120	233	27,960
	Reported	131	233	30523
	Difference	11		2563
2011	Planned	120	233	27,960
	Reported	145	233	33,785
	Difference	25		5,825
2012	Planned	100	233	23,300
	Reported	81	233	18,873
	Difference	-19		-4427
2013	Planned	75	233	17,475
	Reported	58	233	13,514
	Difference	17		-3961
2014	Planned	75	233	17,475
	Reported	75	233	17,475
	Difference	17		0
2015	Planned	195	233	45,435
	Reported	84	233	19,572
	Difference	-111		-25,863

2016	Planned	195	233	45,435
	Reported	73	233	17,009
	Difference	-122		-28,426

BMP: Single Family – High Efficiency Showerhead Exchange
Cost: \$3.50/showerhead

Year		Units	Savings/Measure Gallons/measure/day	Total Savings (gal/day)
2007	Planned	1600	35	56,000
	Reported	4194	35	146,790
	Difference	2594		90,790
2008	Planned	1600	35	56,000
	Reported	2437	35	85,295
	Difference	837		29,295
2009	Planned	1480	35	51,800
	Reported	2163	35	75,705
	Difference	683		23,905
2010	Planned	1500	35	52,500
	Reported	1986	35	69,510
	Difference	486		17,010
2011	Planned	1500	35	52,500
	Reported	1936	35	67,760
	Difference	436		15,260
2012	Planned	1500	35	52,500
	Reported	3158	35	110,530
	Difference	1658		58,030
2013	Planned	1100	35	38,500
	Reported	1228	35	42,980
	Difference	128		4,480
2014	Planned	1500	35	52,500
	Reported	1991	35	69,685
	Difference	491		17,185
2015	Planned	1500	35	52,500
	Reported	2554	35	89,390
	Difference	1,054		36,890

2016	Planned	1500	35	52,500
	Reported	1463	35	51,205
	Difference	-37		-1,295

BMP: Multifamily – High Efficiency Showerhead Exchange
Cost: \$3.50/showerhead

Year		Units	Savings/Measure Gallons/Unit/Day	Total Savings Gallons Per Day (gal/day)
2007	Planned	1600	35	56,000
	Reported	4193	35	146,755
	Difference	2593		90,755
2008	Planned	1600	35	56,000
	Reported	4000	35	140,000
	Difference	2400	35	84,000
2009	Planned	2120	35	74,200
	Reported	2130	35	74,550
	Difference	10		350
2010	Planned	5000	35	175,000
	Reported	6519	35	228,165
	Difference	3485		53,165
2011	Planned	2500	35	87,500
	Reported	2857	35	99,995
	Difference	357		12,495
2012	Planned	2000	35	70,000
	Reported	2163	35	75,705
	Difference	163		5,705
2013	Planned	800	35	28,000
	Reported	814	35	28,490
	Difference	14		490
2014	Planned	1000	35	35,000
	Reported	1167	35	40,845
	Difference	67		5,845
2015	Planned	1000	35	35,000
	Reported	0	35	0

	Difference	-1000		-35,000
2016	Planned	2003	35	70,105
	Reported	77	35	2,695
	Difference	-1,926		-67,410

BMP: Single Family High Efficiency Retrofit Kit (includes bathroom and kitchen faucet aerators and dye tablets)

Cost: \$5/kit

Year		Units	Savings/Measure Gallons/measure/day	Total Savings (gal/day)
2007	Planned	1600	12	19,200
	Reported	4194	12	50,328
	Difference	2594		31,128
2008	Planned	1600	12	19,200
	Reported	2437	12	29,244
	Difference	837		10,044
2009	Planned	1480	12	17,760
	Reported	1498	12	17,976
	Difference	18		216
2010	Planned	1000	12	12,000
	Reported	1321	12	15,852
	Difference	321		3,852
2011	Planned	1000	12	12,000
	Reported	1417	12	17,004
	Difference	417		5,004
2012	Planned	1000	12	12,000
	Reported	2576	12	30,912
	Difference	1576		18,912
2013	Planned	800	24	9,600
	Reported	890	24	10,680
	Difference	90		1,080
2014	Planned	1000	24	24,000
	Reported	1893	24	45,432
	Difference	893		21,432
2015	Planned	1000	24	24,000
	Reported	1345	24	32,280

	Difference	345		8,280
2016	Planned	1000	24	24,000
	Reported	160	24	3,840
	Difference	-840		-20,160

BMP: Multifamily High Efficiency Retrofit Kit (includes bathroom and kitchen faucet aerators and dye tablets)

Cost: \$5/kit

Year		Units	Savings/Measure Gallons/measure/day	Total Savings (gal/day)
2007	Planned	1600	12	19,200
	Reported	4193	12	50,316
	Difference	2593		31,116
2008	Planned	1600	12	19,200
	Reported	4000	12	48,000
	Difference	2400		28,800
2009	Planned	2120	12	25,440
	Reported	2130	12	25,560
	Difference	10		120
2010	Planned	2600	12	31,200
	Reported	5657	12	67,884
	Difference	3057		36,684
2011	Planned	2000	12	24,000
	Reported	2618	12	31,416
	Difference	618		7,416
2012	Planned	1500	12	18,000
	Reported	1567	12	18,804
	Difference	67		804
2013	Planned	500	24	12,000
	Reported	662	24	15,888
	Difference	162		3,888
2014	Planned	750	24	18,000
	Reported	576	24	13,824
	Difference	-174		-4,176
2015	Planned	750	24	18,000
	Reported	0	24	0

	Difference	-750		-18,000
2016	Planned	1,250	24	30,000
	Reported	9	24	8,640
	Difference	-1,241		-29,784

BMP: Single Family Senior and Low Income High Efficiency Toilet & Retrofit Kit***Cost: N/A****Note: Program ended October 2012**

Year		Units	Savings/Account (Address) Gallons/account/day	Total Savings (gal/day)
2007	Planned	750	64	48,000
	Reported	890	64	56,960
	Difference	140		8,960
2008	Planned	1000	64	64,000
	Reported	1124	64	71,936
	Difference	124		7,936
2009	Planned	1000	64	64,000
	Reported	1000	64	64,000
	Difference	0		
2010	Planned	1000	64	64,000
	Reported	845*	64	54,080
	Difference	-155		-9,920
2011	Planned	750	64	48,000
	Reported	706	64	45,184
	Difference	44		-2,816
2012	Planned	750	64	48,000
	Reported	463	64	29,632
	Difference	-287		-18,368

*Note: Reported Value is for each address where a retrofit occurred. A retrofit consists of up to 2 HETs, 2 showerheads, 2 bathroom faucet aerators and a kitchen aerator.

BMP: Single Family High Efficiency Clothes Washer Rebates

Cost: N/A

Note: Program ended October 2009

Year		Units	Savings/Measure gallon/measure/day	Total Savings (gal/day)
2007	Planned	0	16.3	0
	Reported	0	16.3	0
	Difference	0		
2008	Planned	150	16.3	2,445
	Reported	849	16.3	13,838.7
	Difference	699		11,393.7
2009	Planned	250	16.3	4,075
	Reported	937	16.3	15,273.1
	Difference	687		11,198.1

BMP: Non-Residential High Efficiency Aerators (Industrial, Commercial and Institutional (ICI))
Cost: \$0.50/aerator

2014	Planned	0	12	0
	Reported	205	12	2,460
	Difference	205		2,460
2015	Planned	0	12	0
	Reported	0	12	0
	Difference	0		0
2016	Planned	0	12	0
	Reported	0	12	0
	Difference	0		0

BMP: Non-Residential County Owned Facilities Landscape Irrigation Evaluation (no rebate)
Cost: \$250/evaluation

Year		Units	Savings/Measure Gallons/measure/day	Total Savings (gal/day)
2007	Planned	22	1,500	33,000
	Reported	22	1,500	33,000
	Difference	0		
2008	Planned	10	1,500	15,000
	Reported	38	1,500	57,000
	Difference	28		42,000
2009	Planned	0	1,500	0
	Reported	0	1,500	0
	Difference	0		
2010	Planned	0	1,500	0
	Reported	3	1,500	4500
	Difference	3		4500
2011	Planned	10	1,500	15000
	Reported	7	1,500	10,500
	Difference	3		-4,500
2012	Planned	0	1500	0
	Reported	16	1500	24,000
	Difference	16		24,000
2013	Planned	0	1500	0
	Reported	0	1500	0
	Difference			
2014	Planned	0	1500	0
	Reported	1	1500	1500
	Difference	1		1500
2015	Planned	0	1500	0
	Reported	0	1500	0
	Difference	0		0

2016	Planned	0	1500	0
	Reported	0	1500	0
	Difference	0		0

BMP: Non-Residential Green Restaurant Evaluation (no rebate)
Cost: \$250/evaluation

Year		Units	Savings/Measure Gallons/measure/day	Total Savings (gal/day)
2007	Planned	0	100	0
	Reported	0	100	0
	Difference	0		
2008	Planned	12	100	1,200
	Reported	14	100	1,400
	Difference	2		200
2009	Planned	12	100	1,200
	Reported	12	100	1,200
	Difference	0		
2010	Planned	12	100	1,200
	Reported	11	100	1,100
	Difference	-1		-100
2011	Planned	0	100	0
	Reported	0	100	0
	Difference	0		
2012	Planned	0	100	0
	Reported	0	100	0
	Difference	0		
2013	Planned	0	100	0
	Reported	0	100	0
	Difference	0		
2014	Planned	0	100	0
	Reported	9	100	900
	Difference	0		900
2015	Planned	0	100	0
	Reported	0	100	0
	Difference	0		0

2016	Planned	0	100	0
	Reported	0	100	0
	Difference	0		0

BMP: Non-Residential Green Lodging Evaluation no rebates
Cost: \$250/evaluation

Year		Units	Savings/Measure gallons/measure/day	Total Savings (gal/day)
2007	Planned	0	1,617	0
	Reported	0	1,617	0
	Difference	0		
2008	Planned	12	1,617	19,404
	Reported	17	1,617	27,489
	Difference	5		8,085
2009	Planned	12	1,617	19,404
	Reported	21	1,617	33,957
	Difference	9		14,553
2010	Planned	0	1,617	0
	Reported	4	1,617	6,468
	Difference	4		6,468
2011	Planned	0	1,617	0
	Reported	3	1,617	4,851
	Difference	3		4,851
2012	Planned	0	1,617	0
	Reported	2	1,617	3,234
	Difference	2		3,234
2013	Planned	0	1,617	0
	Reported	1	1,617	1,617
	Difference	1		1,617
2014	Planned	0	1,617	0
	Reported	1	1,617	1,617
	Difference	1		1,617
2015	Planned	1	1,617	1,617
	Reported	80	1,617	129,360
	Difference	79		127,743

2016	Planned	0	1,617	0
	Reported	0	1,617	0
	Difference	0		0

BMP: Non-Residential Industrial, Commercial and Institutional (ICI) Water-Use Evaluation/Implementation

Cost: N/A

Year		Units	Savings/Measure (gpm/d)	Total Savings (gal/day)
2007	Planned	22	1,500	33,000
	Reported	22	1,500	33,000
	Difference	0		
2008	Planned	10	1,500	15,000
	Reported	38	1,500	57,000
	Difference	28		42,000
2009	Planned	0	1,500	0
	Reported	0	1,500	0
	Difference	0		
2010	Planned	0	1,500	0
	Reported	0	1,500	0
	Difference	0		
2011	Planned	0	1,500	0
	Reported	0	1,500	0
	Difference	0		
2012	Planned	0	1,500	0
	Reported	0	1,500	0
	Difference	0		
2013	Planned	0	1,500	0
	Reported	0	1,500	0
	Difference	0		
2014	Planned	0	1,500	0
	Reported	0	1,500	0
	Difference	0		0
2015	Planned	0	1,500	0
	Reported	0	1,500	0

	Difference	0		0
2016	Planned	0	1,500	0
	Reported	0	1,500	0
	Difference	0		0